

element into contact with a gaseous etching medium for etching silicon selectively in a chemical reaction, wherein gaseous reaction products are produced during the step of selectively etching.

17. (New) The method of claim 16, wherein the gaseous etching medium includes one of an interhalogen compound, which is one of in a gaseous state and has been converted to the gaseous state, and a fluorine-noble gas compound, the fluorine-noble gas compound including at least one of chlorine trifluoride, bromine trifluoride, iodine pentafluoride and xenon difluoride.

18. (New) The method of claim 16, wherein the gaseous reaction products include silicon tetrafluoride.

19. (New) The method of claim 16, wherein the step of selectively etching is performed at a pressure of 0.1 mbar to 1,000 mbar.

20. (New) The method of claim 16, wherein the gaseous etching medium is diluted with at least one of an inert gas and helium to control at least one of an aggressiveness of the gaseous etching medium and an etching rate.

21. (New) The method of claim 16, wherein at least a part of the gaseous etching medium is one of: convertable from a solid phase to the gaseous phase by thermal sublimation using a solid source; convertable from a liquid phase to the gaseous phase by introducing an inert gas using a bubbler; and convertable from one of the liquid phase and the solid phase to the gaseous phase based on a vapor pressure at a defined temperature.

22. (New) The method of claim 16, wherein the at least one silicon element is sawn from the silicon wafer prior to performing the step of selectively etching.

23. (New) The method of claim 22, wherein the silicon wafer is attached to a carrier, and the carrier is removed after the step of selectively etching.

24. (New) The method of claim 22, wherein the at least one silicon element is initially left on a carrier after the at least one silicon element has been sown out and treated while still attached to the carrier.

25. (New) The method of claim 24, further comprising the step of expanding the sawing sheet after sawing out the plurality of silicon elements and before performing the step of selectively etching to increase a distance between the at least one silicon element and another silicon element, wherein the frame is used as an expansion frame for the sawing sheet.

26. (New) The method of claim 23, further comprising the step of drying the at least one silicon element before performing the step of selectively etching by heating the at least one silicon element with a radiation heater in a vacuum at a pressure of less than about 0.1 μ bar.

27. (New) The method of claim 16, further comprising the step of adjusting an etching rate while selectively etching the at least one silicon element by selecting at least one of the gaseous etching medium, a composition of the gaseous etching medium and an etching temperature.

28. (New) The method of claim 16, further comprising the step of removing the gaseous reaction products produced during the step of selectively etching at least one of during the step of selectively etching and after the step of selectively etching.

29. (New) The method of claim 16, further comprising the step of removing, after performing the step of selectively etching in a reaction chamber, at least one of a leftover etching medium and a leftover reaction product from at least one etched silicon element in a vacuum in a load lock, the step of removing being performed at a pressure of less than about 0.1 μ bar and at an elevated temperature.

30. (New) The method of claim 16, wherein the step of selectively etching includes selectively etching an etch mask on the at least one silicon element.